WHAT IS CLAIMED IS:

1. An element for making patterns on an electroconductive substrate, the element comprising a support, on which is disposed:

a) a conductive layer containing an electrically conductive polymer, a polyanion and a conductivity enhancing agent; and

b) a mixing layer containing a thermally mobile material; wherein, upon imagewise heating the mixing layer, the thermally mobile material mixes with the conductive layer, thereby causing the initial surface resistivity (SR) of the conductive layer to imagewise increase from an initial value SR_i, which is lower than 10^5 Ω/square, to $SR_i\Delta$, Δ being at least 10^2.

2. The element of claim 1 patterned for use in an electronic or semiconductor device.

3. The element of claim 1 patterned for use as a printed circuit board, an integrated circuit, a display, an electroluminescent device or a photovoltaic cell.

4. The element of claim 1 wherein the thermally mobile material is contained in a polymeric matrix.

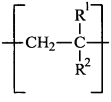
5. The element of claim 4 wherein the polymeric matrix comprises a crosslinked or branched polymer.

6. The element of claim 5 wherein the crosslinked polymer is poly(styrene-co-indene-co-divinylbenzene), poly(styrene-co-acrylonitrile-co-divinylbenzene), poly(styrene-co-butadiene-co-divinylbenzene).

7. The element of claim 1 wherein the thermally mobile material is a pigment, a dye, or a combination of both.

8. The element of claim 4 wherein the polymeric matrix is a thermally mobile material.

9. The element of claim 1 wherein the thermally mobile material has recurring units of the following formula:



wherein:

R^1 represents cyano, isocyanate, azide, sulfonyl, nitro, phosphoric, phosphonyl, heteroaryl, or

where

X is O, S, NR, or $N^+(R)_2$;

R^3 is R, OR, O—M^+, OCOOR, SR, NHCOR, $NHCON(R)_2$, $N(R)_2$ or $N^+(R)_3$;

M^+ is an alkali or ammonium moiety;

R is hydrogen, halogen, or an alkyl or cycloalkyl group; and

R^2 is hydrogen, alkyl or from the same list as R^1.

10. The element of claim 1 wherein the conductive layer contains an optional film-forming polymeric binder.

11. The element of claim 1 wherein the conductivity enhancing agent is an organic compound containing dihydroxy, poly-hydroxy, carboxyl, amide, or lactam groups.

12. The element of claim 11 wherein the organic compound containing dihydroxy, poly-hydroxy, carboxyl, amide, or lactam groups is:

(a) represented by the following Formula II:

$(OH)_n$-R-$(COX)_m$

II

wherein m and n are independently an integer of from 1 to 20, R is an alkylene group having 2 to 20 carbon atoms, an arylene group having 6 to 14 carbon atoms in the arylene chain, a pyran group, or a furan group, and X is -OH or –NYZ, wherein Y and Z are independently hydrogen or an alkyl group; or

(b) a sugar, sugar derivative, polyalkylene glycol, or glycerol compound; or

(c) selected from the group consisting of N-methylpyrrolidone, pyrrolidone, caprolactam, N-methyl caprolactam, or N-octylpyrrolidone.

13. The element of claim 1 wherein said conductivity enhancing agent is a N-methylpyrrolidone, pyrrolidone, caprolactam, N-methylcaprolactam, N-octylpyrrolidone, sucrose, glucose, fructose, lactose, sugar alcohol, 2-furan carboxylic acid, 3-furan carboxylic acid, sorbitol, glycol, ethylene glycol, glycerol, diethylene glycol, or triethylene glycol, or a mixture of any two or more of these compounds.

14. The element of claim 1 wherein said conductivity enhancing agent is N-methylpyrrolidone, pyrrolidone, caprolactam, N-methyl caprolactam, or N-octylpyrrolidone.

15. The element of claim 1 wherein said conductivity enhancing agent is ethylene glycol, diethylene glycol or glycerol.

16. The element of claim 1 wherein said conductivity enhancing agent is one or more than one compound selected from the group consisting of N-methylpyrrolidone, sorbitol, ethylene glycol, glycerol, and diethylene glycol.

17. The element of claim 5, wherein n and m independently of one another denote an integer from 2 to 8.

18. The element of claim 11 wherein the organic compound containing lactam groups is n-methylpyrrolidone, pyrrolidone, caprolactam, n-methylcaprolactam, or n-octylpyrrolidone.

19. the element of claim 12 wherein the conductivity enhancing agent is sucrose, glucose, fructose, lactose, sorbitol, mannitol, 2-furancarboxylic acid, 3-furancarboxylic acid, ethylene glycol, glycerol, di- or triethylene glycol. solution.

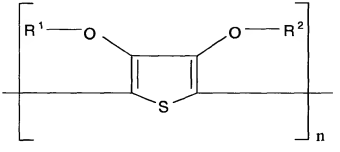
20. The element of claim 1 wherein the conductive polymer is a substituted or unsubstituted pyrrole-containing polymer, a substituted or unsubstituted thiophene-containing polymer, or a substituted or unsubstituted aniline-containing polymer.

21. The element of claim 1 wherein the layer containing the conductive polymer contains 10 to 1000 mg/m^2 dry coating weight of the conductive polymer.

22. The element of claim 1 wherein the layer containing the conductive polymer contains 20 to 500 mg/m^2 dry coating weight of the conductive polymer.

23. The element of claim 1 wherein the layer containing the conductive polymer comprises a mixture containing:

a) a polythiophene according to Formula I;



I

wherein each of R^1 and R^2 independently represents hydrogen or a C1-C4 alkyl group or together represent an optionally substituted C1-C4 alkylene group or a cycloalkylene group, preferably an ethylene group, an optionally alkyl-substituted methylene group, an optionally C1-C12 alkyl- or phenyl-substituted 1,2-ethylene group, a 1,3-propylene group or a 1,2-cyclohexylene group, and n is 5-1000;

b) a polyanion compound; and, optionally

c) a film forming polymeric binder.

24. The element of claim 23 wherein the polyanion is an anion of a polymeric carboxylic acid.

25. The element of claim 23 wherein the polyanion is a polyacrylic acid, a poly(methacrylic acid), a poly(maleic acid), or a polymeric sulfonic acid.

26. The element of claim 23 wherein the polyanion is a polystyrenesulfonic acid or a polyvinylsulfonic acid.

27. The element of claim 23 wherein the film-forming polymeric binder comprises from 5 to 95 wt% of the layer containing the conductive polymer.

28. The element of claim 23 wherein the film-forming polymeric binder is selected from the group consisting of water-soluble or water-dispersible hydrophilic polymers, maleic acid or maleic anhydride copolymers, cellulose derivatives, polyvinyl alcohol, and poly-N-vinylpyrrolidone.

29. The element of claim 23 wherein the film-forming polymeric binder is gelatin or gelatin derivatives.

30. The element of claim 23 wherein the film-forming polymeric binder is carboxymethyl cellulose, hydroxyethyl cellulose, cellulose acetate butyrate, diacetyl cellulose, or triacetyl cellulose.

31. The element of claim 23 wherein the film-forming polymeric binder is an aqueous emulsion of addition-type homopolymers and copolymers prepared from ethylenically unsaturated monomers.

32. The element of claim 31 wherein the monomers are selected from the group consisting of acrylates, methacrylates, acrylamides, methacrylamides, itaconic acid and its half-esters and diesters, substituted and unsubstituted styrenes, acrylonitrile, methacrylonitrile, vinyl acetates, vinyl ethers, vinyl and vinylidene halides, and olefins.

33. The element of claim 23 wherein the film-forming polymeric binder is an aqueous dispersion of polyurethanes or polyesterionomers.

34. The element of claim 1 wherein the support is transparent, opaque, or reflective.

35. The element of claim 1 wherein the support is glass, a polymeric film, paper, silicon wafers, or glass reinforced epoxy.

36. The element of claim 35 wherein the polymeric film support is polyester, polycarbonate, polystyrene, cellulose esters, or polyolefins.

37. The element of claim 1 wherein the support is flexible or rigid.

38. The element of claim 1 wherein the support comprises cellulose acetate, poly(ethylene terephthalate) or poly(ethylene naphthalate).

39. The element of claim 1 wherein the support is surface-treated.

40. The element of claim 1 wherein the support is between 50 μm and 254 μm thick.

41. The element of claim 1 wherein the dry coverage of the conductive layer is between 0.002 and 0.5 g/m2.

42. The element of claim 1 wherein the conductive layer is coated from a dispersion of a conductive polymer in water, alcohol or acetone.

43. A method of patterning an electroconductive layer on a support, the support having thereon a mixing layer containing a thermally mobile material and a conductive polymer layer containing a polythiophene), a polyanion and a di- or polyhydroxy organic compound, whereby the mixing layer is heated image-wise in selected areas, causing the thermally mobile material to mix with the conductive layer, wherein;
the surface resistivity (SR) of the conductive layer is decreased or increased from an initial value SR_i, which is lower than 10^4 Ω/square to $SR_i\Delta$, Δ being at least 10^3 in said selected areas without substantially ablating or destroying the polymer layers.